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HARVESTING AND HANDLING CALIFORNIA CHERRIES FOR EASTERN SHIPMENT

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The successful harvesting and handling of cherries for Eastern shipment present great difficulties and require painstaking methods. The fruit ripens on the tree and deteriorates rapidly after picking. It must therefore be handled quickly and with care.

Cherry production in California is rapidly increasing. During the last five years there has been a steady gain in car-lot shipments, from 330 cars in 1917 to 665 cars in 1921.[1] In 1920 there were 347,572 trees of non-bearing age and 657,470 trees of bearing age.[2] These figures indicate an early increase in the number of fruiting trees and much consideration must be given to the disposal of the crop.

During the season of 1921 the Division of Pomology conducted a survey of the cherry districts of the state with a view of determining the best methods of picking, packing, and handling the crop. A number of successful cherry growers, who have developed highly efficient methods, were consulted and their systems analyzed. This circular gives a detailed account of the operations found to be most satisfactory.[3]

HARVESTING

WHEN TO PICK

The sweet cherry is picked when nearly mature, that is, when practically all the changing of starch to sugars has ceased, and the fruit has attained the color characteristic of the variety. The picker must be acquainted with the different varieties to know when each has the proper color and maturity.

[1] Reports of the Pacific Fruit Express Company and California Fruit Distributors.

[2] Fourteenth Census of the United States. Bulletin, Agriculture: California.

[3] The writer is indebted to the following individuals for information and data contained in this circular: M. Sharpe, F. B. McKevitt, Jr., A. G. Tucker, C. Collins, H. Bassford of Vacaville; B. H. Bancroft, F. S. Jones of Cordelia; W. S. Killingsworth, F. W. Read of Sacramento; and D. Howcroft of Newcastle.

The following table shows the approximate relative dates of ripening in the Sacramento Valley:[4]

Variety	Time of ripening
Early Purple Guigne	April 20 — May 1
Early Chapman	April 20 — May 10
Knight's Early Black	April 25 — May 10
Burbank	May 1 — May 20
Advance	May 5 — May 15
Rockport	May 5 — May 15
Black Tartarian	May 7 — May 25
Black Eagle	May 8 — May 20
Bing	May 18 — June 5
Napoleon (Royal Ann)	May 19 — June 10
Centennial	May 20 — June 10
Black Republican (Black Oregon)	May 26 — June 15
Lambert	June 5 — June 26

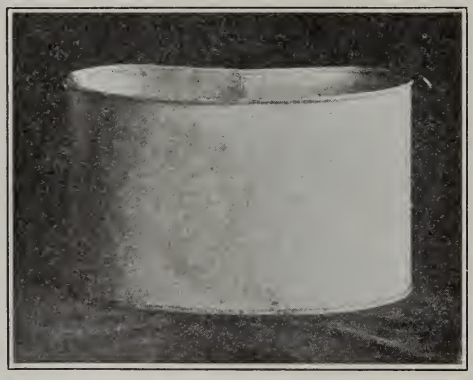


Fig. 1.—The cherry picking cup.

At the first picking only a few of the fruits are selected. At the second picking the bulk of the crop is removed from the tree, and the balance at the third and fourth pickings. The condition of the weather influences the time of harvesting. Cherries should be picked only when dry, for wet fruit quickly develops brown rot and mildew, and one moist cherry may spoil a whole box.

How to Pick

All cherries for shipment must be picked with the stems attached. If the stems are removed, juice exudes, and the fruit quickly deteriorates. In picking, a cherry is grasped at the base of the pedicel with the thumb and forefinger and turned back against the spur. Care should be exercised not to break off the unripe fruits or to injure the fruit-spur. Both hands are used in the picking operation, one to remove the fruit and the other to hold the branch.

[4] Courtesy of California Fruit Exchange.

PICKING EQUIPMENT

Picking Receptacles.—There are several types of picking receptacles now in use. The galvanized-iron cherry picking cup (Fig. 1) which straps to the waist of the picker is the best. It has a convenient shape and such a volume that the fruit is not crushed by its own weight; it is easily carried and allows the use of both hands in picking. Some growers prefer the ten-pound picking pail or basket, but these are too deep for cherries and do not allow freedom of the hands, unless suspended on the ladder or tree.

Fig. 2.—Cherry pickers at work. Note the type of tripod ladders and correct manner of placing same under the tree. Picker at right is using a picking hook to bring a branch within reach. Note the picking cups strapped to the waists of the pickers.

Delivery Containers.—A galvanized-iron water pail is commonly used for delivering the fruit to the packing house. This is filled from the picking cup. Some growers prefer to use the same pail or basket for both picking and delivering to the packing house. Other growers use lug boxes, which are satisfactory, provided they are only partly filled.

Ladders.—The tripod or three-legged ladder has come to be commonly accepted for orchard use. (Fig. 2.) There are many styles of this ladder, most of which are satisfactory. The ladder should be well constructed, of first-class material, and light enough to be handled by the picker.

Picking Hook.—A picking hook made from a forked branch aids the picker to bring branches within reach. (Fig. 2.)

Handling the Picking Crew

A Good Foreman.—The picking foreman is the most important man in the orchard at harvest time. He should have a broad knowledge of the work and of the characteristics of the different varieties. He must be thoroughly acquainted with the orchard. He must be able to instruct the pickers properly and to carry out a systematic plan for getting the fruit harvested in the right condition. Fruit that comes to the packing house green or over-ripe indicates that the foreman is not capable.

Work of the Pickers.—Each picker is supplied with a ladder, a picking hook, and a picking cup. A number is painted on the cup for the identification of the picker who is known by this number throughout the season. The pickers work in pairs and each pair is assigned to trees or rows of trees by the foreman.

Empty delivery pails are left near the pickers by the field man who also collects the harvested fruit. As each picker fills a delivery pail from his picking cup, he chalks his number on its side, or places a numbered card in it. It is considered best to use numbered cards since chalk marks must be washed off before the buckets are returned to the pickers. Care should be taken that the full pails are kept in the shade until hauled away.

Paying the Pickers.—The best results in picking cherries are obtained when the pickers are paid by the hour rather than by the amount of fruit picked. Both systems have been tried in large operations and it is the general observation that a better quality of fruit is secured when the pickers have no inducement to rush through the work. The amount of fruit picked, however, is tallied each day and any picker found considerably below the average must show good reason for the shortage. The pickers should average about ten pounds an hour. The hourly pay for pickers during the season of 1921 was on the average thirty cents.

Hauling to the Packing House

Cherries should be transferred to the packing house with the least possible delay. The orchard truck or wagon should be "easy riding," built low to facilitate loading and unloading, and large enough to carry from eight to twelve hundred pounds of fruit. The fruit is loaded on the truck or wagon by field boys who collect the delivery pails and distribute empty ones.

PACKING

The Packing House

There are many types of structures in use as cherry packing houses, ranging from tents and sheds to permanent and well-equipped buildings. Each grower must determine for himself the kind that will best suit his needs. A well-built frame building, providing good light and ventilation is a desirable packing house. It should be large enough to accommodate packing tables, nailing presses, shook and boxes, without crowding the packers or obstructing the handling of the fruit. It should, preferably, have a wooden floor, with platforms approximately of the same height as the wagons and trucks used in handling the fruit.

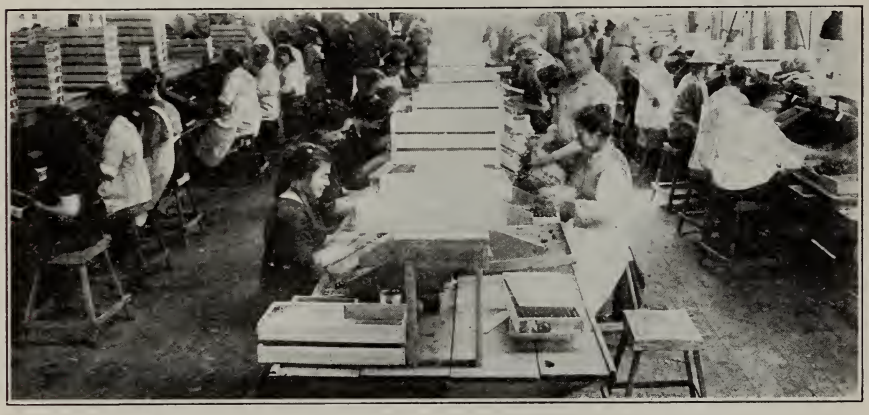


Fig. 3.—Interior of packing house. Note arrangement of packing tables and packing trays.

Arrangement.—The packing house should be arranged in such a way that the fruit will pass through the various operations of unloading, delivering to the packers, packing, inspecting, nailing, stacking, and finally loading so that there will be the least amount of lost motion. By a systematic arrangement of equipment in the packing house the cost of handling is reduced to the minimum.

Equipment

Packing Tables.—The best tables are low enough to enable the packers to sit while working. They may be either three or six feet wide, for single or double rows of packers, respectively, and from twenty to thirty feet long. A shelf about one foot wide and about two feet above the top of the table is convenient for empty boxes. (Fig. 3.) Small portable trays placed on the table are used to hold

the cherries for packing. These trays keep the cherries clean and do not hold so many that they will be crushed. On the side of each tray is an arm to support one end of the box while being packed.

Inspection and Nailing Tables.—The bottom and top of each packed box of cherries should be inspected. Tables should be supplied for examining the packed boxes before the bottom piece is nailed. The nailing bench should be solidly built and fitted with forms to hold the box and the lid in place while being nailed. (Fig. 4.) It should adjoin the inspection table.

Fig. 4.—Nailing the packed box. A form is used to hold the box and lid in place for nailing. Note the bolt opposite the center of the box, which prevents crushing the fruit while the center is being nailed. A nail stripper greatly facilitates nailing.

Platform Scales.—A set of officially tested scales is essential in every packing house for determining whether containers have the required minimum weight or are far in excess. The scales should be near the inspectors for convenience.

Nail Strippers.—A nail stripper should be used in all fruit-packing houses. (Fig. 4.) Soapstone or talcum powder is used in the stripper so that the nails will slip easily into place.

Rubber Stamps.—The state standardization law requires that all boxes of cherries be properly labeled with the variety and style of

pack.[5] There is no more satisfactory way of supplying this information than by the use of rubber stamps bearing the name of the variety and the number of rows in the box, e.g., "Chapman," "11 rows."

SUPPLIES

Box Materials.—It is believed by the writer that California cherries should be shipped in either the standard cherry (ten-pound) box, for packed fruit, or the peach size (twenty-pound) cherry lug, for unpacked fruit. The "Chadbourne-Lambert" cherry lug is very satisfactory, but has not yet been standardized. The standard cherry lug or "Schute" lug may also be used for unpacked fruit, but this container is gradually being discarded for the peach-size cherry lug. Carton containers may be used for fancy trade. The California or "Los Angeles" lug is too deep for cherries and should not be used.

DIMENSIONS OF CHERRY CONTAINERS

Name	Depth inside, inches	Width inside, inches	Length outside, inches
Standard cherry box	2¼	9	19¾
Peach-size cherry lug	4½	11½	19¾
"Chadbourne-Lambert" lug	3	11½	19¾
Standard cherry lug	4½	9	19¾
California lug	5¾	14	17½

These boxes come in the knock-down form commonly called "shook." Cherry boxes should be made of good, clean, smooth, wood, with inside edges beveled the least bit. In ordering, the grower need only specify the type desired. The following specifications should be conformed to:

STANDARD (TEN-POUND) CHERRY BOX

Ends and center, 3 pieces	5/8" × 2¼" × 9"
Sides, 2 pieces	3/16" × 2¼" × 19¾"
Top, 1 piece	3/16" × 9" × 19¾"
Bottom, 1 piece	3/16" × 8¾" × 9"
Cleats, 2 pieces	3/8" × ¾" × 9"

PEACH SIZE (TWENTY-POUND) CHERRY LUG

Ends and center, 3 pieces	5/8" × 4" × 11½"
Sides, 2 pieces	¼" × 4" × 19¾"
Top and bottom, 4 pieces	¼" × 5¾" × 19¾"
Cleats, 4 pieces	3/8" × ¾" × 11½"

Use cement coated 4d special orange box nails, 28 per box.

[5] California Fruit and Vegetable Standardization Act. Copies of this law may be obtained from the State Department of Agriculture, Sacramento.

Labels.—It is required by law that all containers of fresh fruit shall bear the name of the orchard where the fruit was produced, the post-office address thereof, or the name of the person, firm, company, corporation or organization that ships it, and the minimum net weight. Such facts are generally printed on a lithographed label which is pasted on the end of the box by the shipper, or sometimes stamped or stenciled on the ends when the shook is made at the factory. It is the opinion of the writer that a simple yet attractive label in two or three colors, bearing a design relating to the fruit contained, is to be preferred to a plain stamped or stenciled design or label.

Waxed Paper.—Four pieces of waxed paper are used in packing the lug boxes. This serves to keep the "face" clean and bright, as well as to prevent the cherries from slipping through the openings between the top and sides. (Fig. 8.)

Personnel of the Packing House

Foreman and Assistants.—The management of the packing house should be entrusted to a man who understands every detail of packing and preparing the fruit for shipment. He must be one who can assume responsibility and get maximum results from the packing-house crew. He should be assisted by men or women of considerable experience in the various packing-house operations, their number depending upon the size of the crew. In packing cherries, forewomen are generally employed to supervise the packers.

Packers.—Women or girls are employed as packers in most cherry packing-houses, because the operation is delicate and painstaking. They usually are more careful and develop greater speed than men. Numbers or letters are assigned so as to identify careless packers and to keep record of the number of boxes each packs.

The packers are paid either by the hour or by the box. The individual grower must decide which system he prefers. Paying by the box results in more packed boxes, but unless carefully inspected, the pack may be inferior. During the season of 1921 the price paid for packing was eighteen cents a box or thirty cents an hour. The average number of boxes packed ranges between fifteen and twenty in ten hours. There are a few expert packers who develop a speed of thirty boxes but this is exceptional.

Inspectors and Nailers.—Careful and capable men should be employed for inspecting and nailing the packed boxes. Great responsibility rests upon these men because they are the last to see the fruit before it is opened on the market. Each box as it comes from the packer must be critically scrutinized for any bruised or blemished

fruit or irregularity in the pack. Inspectors should never fail to correct or return an improper pack. Generally the same person does both inspecting and nailing; but in the largest packing houses, where the amount of fruit handled is great, it is preferred to have one or two individuals assigned strictly to inspection. In the latter case the nailers are charged only with applying the bottoms. This is followed by a final inspection of the top or "face" which is conducted by the chief inspector.

Helpers.—Other operations, such as unloading, delivering fruit to the packers, supplying the empty boxes, punching packers' tickets, transferring packed boxes to the inspection table, filling the lug boxes, removing the cull fruit, and loading are performed by floor boys.

Box Makers.—Making up the shook is generally arranged for by contracting with expert box makers, who travel through the fruit sections during the harvest season. Some growers employ local men or boys who are proficient nailers for this work. Box makers are usually paid by the piece rather than by the day or hour. In 1921 one cent a box was the usual rate of pay.

PACKING-HOUSE OPERATIONS

Labeling.—Labeling is most conveniently done before the boxes are made. The lithographed labels should be removed from their bundles and spread out in water for at least twelve hours before pasting in order that the paste will thoroughly penetrate the paper. If the labels are put on dry they curl and drop off when the paste dries. The paste should be mixed about twelve hours before application so it will stick well. A convenient device for labeling is a form or slide of such depth and width as to accommodate the end pieces and long enough to contain from thirty to fifty ends. This is constructed as a table raised about three and a half feet from the floor.

The end pieces are placed side by side in this slide and the paste is applied with a wide brush to the entire row. The labels are then taken from the water and carefully placed on the end pieces. The excess paste is washed off with a brush and clean water. The ends must then be dried. This is done by stacking them or placing them on trays until dry.

One person labels and stacks on the average, about fifteen hundred ends in ten hours. The cost of labeling averages about thirty cents for one hundred ends.

Making the Boxes.—Boxes are made at a specially constructed bench, which is fitted with a form to hold the end and center pieces in place while the top piece is nailed on. The box maker selects one

labeled end piece, and two plain pieces for the center and opposite end, and places them in their proper positions in the form. He then places the top piece squarely on the ends with a cleat at each end, secures nails from the nail stripper, and proceeds to drive the nails, sending each one into the wood with a single stroke. The nails are driven flush with the surface of the wood and not sunk. All nails whose points are exposed should be withdrawn. The half-finished box is removed from the form and placed on a lower shelf where the side

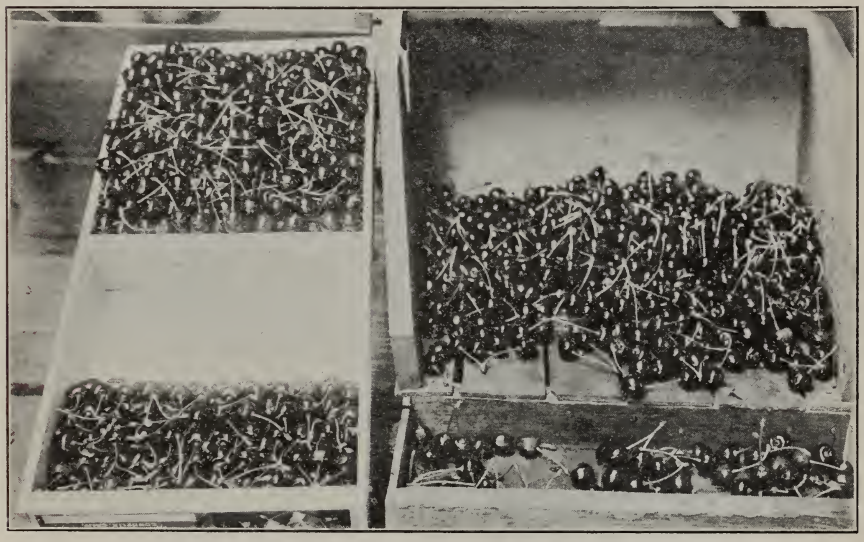
Fig. 5.—Delivery pails full of fruit awaiting to be transferred to the packers. Observe the pickers' numbers chalked on the pails. Inspection table in the background.

pieces are nailed on. The box maker stacks the completed boxes behind him. Expert box makers construct as many as nine hundred boxes per day, while a good average is about five hundred.

Receiving and Supplying Fruit to the Packers.—The cherries are unloaded from the orchard wagon at the packing house door by the driver assisted by the floor boys. The picker's number on each bucket is noted and tallied by one of the assistants. The pails of fruit are stacked on the floor near the packing tables. (Fig. 5.) As the packers call for fruit the floor boys take the pails and empty them into the packing trays, being careful to pour the cherries out gently.

Packing the Standard Cherry Box.—The empty box is placed so as to incline toward the packer at an angle of about thirty degrees.

The first essential in packing is careful grading and sizing. The fruit must be selected for uniformity of maturity, color, and size. Fruit that is green, over-ripe, deformed, cracked, bruised, without stems, or blemished in any way is put in the cull box. The top layer or "face" of each section of the box is packed first. Cherries of the same size are carefully placed on their sides, with the flat surface, which has the black line in the suture, up, and with the stems toward the packer.



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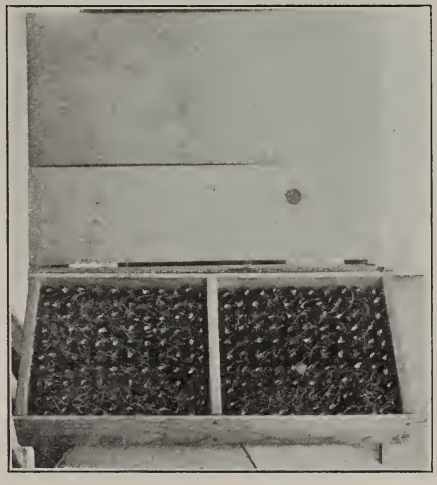

b

Fig. 6.—Various steps in packing the cherry box. (*a*) Starting the pack, note packing tray. (*b*) Box "faced" with two layers of cherries.

Holding the fruit in position with one hand and selecting fruit with the other, the packer arranges the cherries in line across the end of the box (Fig. 6*a*.) Each successive row is placed in direct alignment (straight pack) with the preceding one. Having packed the first layer in this manner, the second layer or "double face" is packed by placing cherries in the spaces formed by the first layer. (Fig. 6*b*.) The box is then reversed and the other section is packed in like manner. This done, the box is placed on the level and filled with cherries without

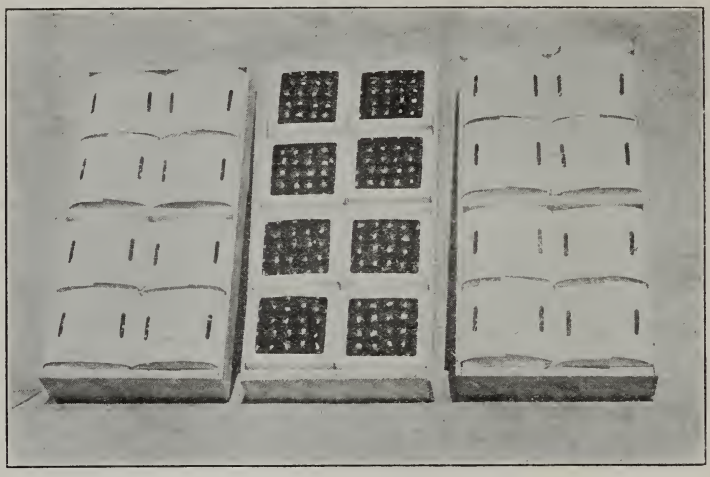

Fig. 7.—Packed cartons, bottom and top views.

regard to definite alignment. The bottom of the pack is neatly finished off so that the corners and sides of the box, especially, are well filled and no fruits or stems extend over the edges of the box. The completed pack is then marked with the packer's number.

When carton sub-containers are used in the ten-pound box each carton is packed as described for the box and when completed the bottom is folded over and fastened. (Fig. 7.)

Filling the Lugs.—Cherries that are too small, slightly overripe, or for other reasons not suited for box packing, may be shipped in the peach-size (twenty-pound) lug. The cherries should be just as carefully graded, however, as when packing the ten-pound box. This container should not be used for inferior and carelessly sorted fruit. Like the ten-pound box, the top is packed first, after being first lined with four pieces of waxed paper. (Fig. 8.) Each section of the box is filled without regard to definite arrangement. The corners and sides especially should be well filled and the bottom neatly finished off so that no fruits or stems hang over the edges. To be assured of

the minimum weight, the box should be placed on the scales. The gross weight should be at least 21½ pounds and not over 23 pounds for the peach-size lug. If outside of these limits correction should be made. The bottom pieces are nailed on and the box stamped with the name of the variety contained. It is not inspected again as is the ten-pound box.

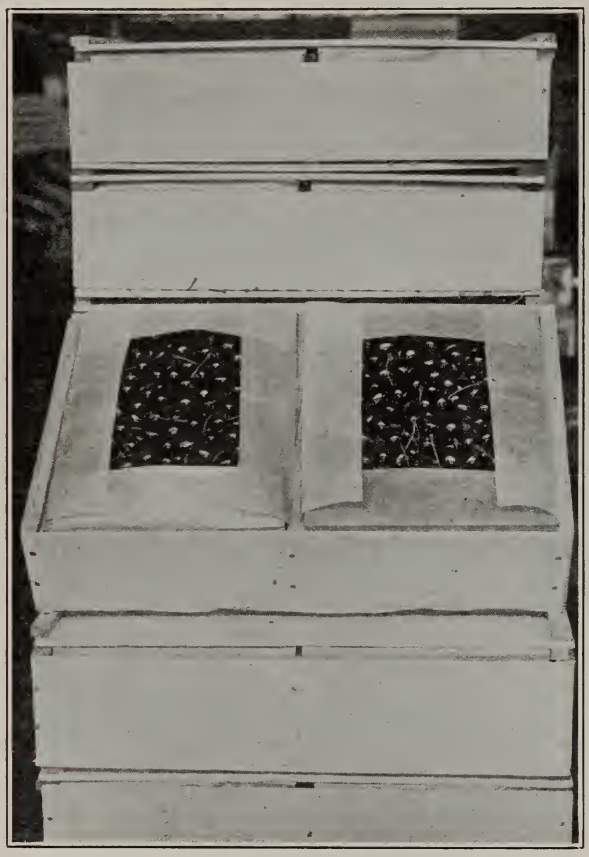

Fig. 8.—Peach size cherry lug, top view. Observe manner of placing waxed paper.

The "Chadbourne-Lambert" lug is filled in the same manner as the peach-size lug. The standard cherry lug or "Schute" lug is packed like the standard cherry box, being "faced" and "double-faced" with rows of cherries. (Fig. 9).

Fruit from the Packers.—When a packer has finished packing a box she calls her number and a floor boy comes to her, who punches her ticket and removes the packed box to the inspection table.

Inspection and Nailing.—The pack of the standard cherry box should receive very careful examination. The bottom of the pack is considered first; attention being given to neatness, fullness, and compactness. If the bottom is not properly packed the "face" will not keep its alignment and position. If there is any shortcoming in this connection the box must be corrected by the inspector or returned to the packer. Only satisfactory packs are nailed. (Fig. 4.) The bottom piece being applied, the box is next passed to the chief and

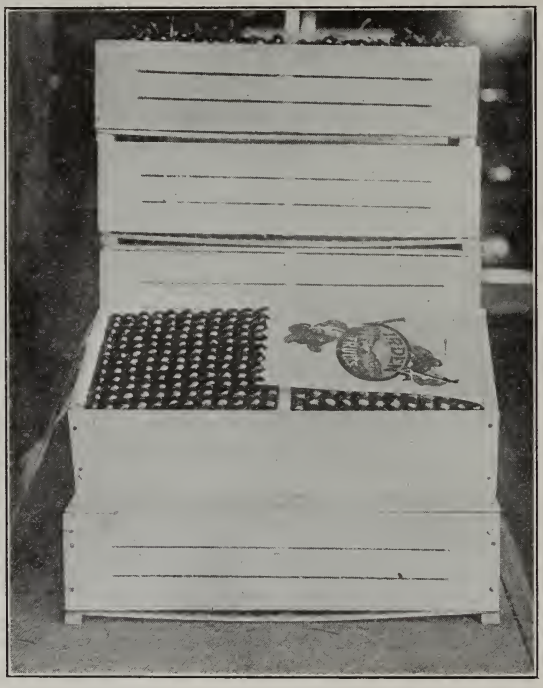

Fig. 9.—The standard (Schute) cherry lug is "faced" in the same manner as the box. This container is considered too deep for cherries. Note the excessive bulge on the bottom, resulting from the weight of the contents.

final inspector who pries one end of the lid open and inspects the top of the pack. (Fig. 10.) The greatest pains should be exercised in this operation, for it is the "face" which determines the sale of the box. Stains on the lid signify crushed cherries and these must be found and replaced with perfect fruits and the stains on the box scraped off. The pack should be level and in perfect alignment throughout, with uniform color and maturity. (Fig. 11.) Stems showing through should be put out of sight. A light feather duster applied to the face improves the appearance and finish of the pack.

(Fig. 10.) A pack that cannot be quickly corrected by the inspector is returned to the person who packed it. Those that need only minor corrections are attended to by the inspector. Having found the box satisfactory the inspector notes the variety and number of rows, and nails down the lid.

Stamping.—Stamping is done by the final inspector or his assistant. The variety and number of rows in the pack are placed on the end of the box by means of rubber stamps.

Fig. 10.—Inspecting the packed box. Stains on the lid indicate crushed fruit. A feather duster run over the "face" improves the appearance of the pack.

Stacking.—The completed boxes are stacked according to variety and size of fruit to facilitate convenient counting and loading. The boxes are placed on top of each other, care being taken to place each box squarely on the one beneath, so that the top box rests on the cleats of the lower box and not on the bulge. Wherever stacked, the bulge of the bottom box must not be allowed to rest on the floor, but elevated on a small rack made for the purpose.

LOADING FOR SHIPMENT

Delivery to the Cars

The packed boxes are delivered to the cars by wagon or automobile truck. The conveyance should be "easy riding" to prevent bruising the fruit. By all means the load should be snug so at all times each box will rest upon the cleats of the one below it. The load should be

covered with a light canvas to protect it from the heat of the sun and the dust of the road. If possible, hauling should be done during the cool part of the day. If there is a railroad siding at the packing house, the packed boxes are transferred direct to the car by means of a hand transfer or "grab" truck, which increases the ease and rapidity of loading.

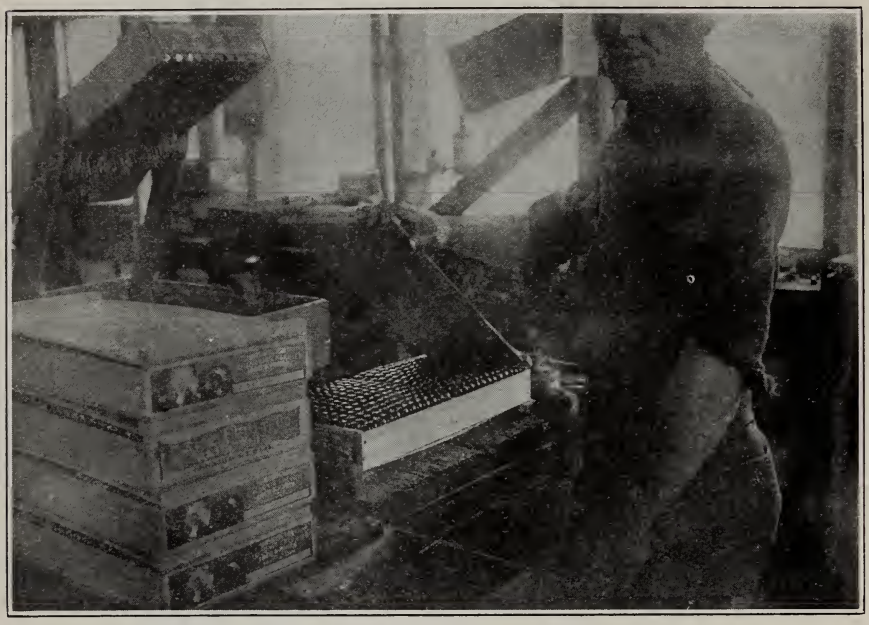

Fig. 11.—A satisfactory box ready for final nailing. Boxes at the left awaiting inspection.

Loading the Cars

Cherries are shipped East in express cars or refrigerator cars. The express cars are supplied with small ice chests which hold ten to twelve standard cherry boxes. The cherries shipped in refrigerator cars are kept cool by ice in the bunkers at each end of the car.

Most cherries are shipped in refrigerator cars, the loading of which is a specialized trade. In order to secure the minimum freight rates to Eastern points, twenty-six thousand pounds must be loaded in each car. As a packed cherry box is estimated at eleven pounds gross, this requires at least 2364 boxes for a car.

In loading a car, the first row of boxes is placed across the floor against the end of the car, leaving equal space between boxes and the sides of the car. Succeeding boxes are stacked fifteen to sixteen high on top of these, every alternate layer of boxes, including the top layer, being secured by two car strips nailed to the ends of each box. The

second row of boxes is placed across the car against the boxes in the first row, all boxes being driven in tight contact with the first row. (Fig. 12.) This manner of loading is continued from each end of the car, leaving a space at the doorway for bracing, the construction of which is definitely prescribed by railroad regulations.

COSTS OF MATERIALS AND OPERATIONS

During the season of 1921 the following data were collected relating to the costs of handling and packing the cherry crop.

COST OF MATERIALS

Item	For 10-lb. box	For 20-lb. lug
Shook	$ .225	$ .22
Making	.010	.015
Labeling	.003	.003
Packing	.225	.105
Paper	.....	.037
Total	$ .463	$ .380
Cost per pound	$ .0463	$ .019

The following figures represent the costs incident to handling cherries in boxes and lugs, respectively, taken at a representative orchard:

COSTS PER BOX FOR HANDLING

Shed overhead	Packing	Shook and making	Field overhead	Picking	Camp	Total	Number of boxes
$ .076	$ .184	$ .163	$ .032	$ .309	$ .029	$ .795	11202
.017	.041	.152	.054	.060	.053	.930	2476

Explanation of headings above:

Shed overhead: Foreman, forewomen, floor boys, inspectors, nailers, helpers.
Packing: Packers.
Shook and making: Box materials, box makers, labeling, paper linings.
Field overhead: Picking foreman, field boys, trucks and drivers, picking and delivery containers, ladders.
Picking: Pickers.
Camp: Housing expense.
Number of boxes: Quantities upon which the averages were computed.

AVERAGE RETURNS OF A REPRESENTATIVE ORCHARD FROM SEVERAL EASTERN MARKETS—SEASON 1920

Name of variety	No. boxes shipped	Average sale price	No. lugs shipped	Average sale price
Advance	68	$3.20	53	$4.53
Rockport	221	3.00	647	3.11
Black Tartarian	2800	2.60	1295	3.15
Napoleon (Royal Ann)	1241	2.05	422	2.90
Bing	1041	2.70	158	3.40
Black Republican	559	2.23	504	3.29
Centennial	.....	.....	42	3.00
Governor Wood	.....	.....	151	2.21

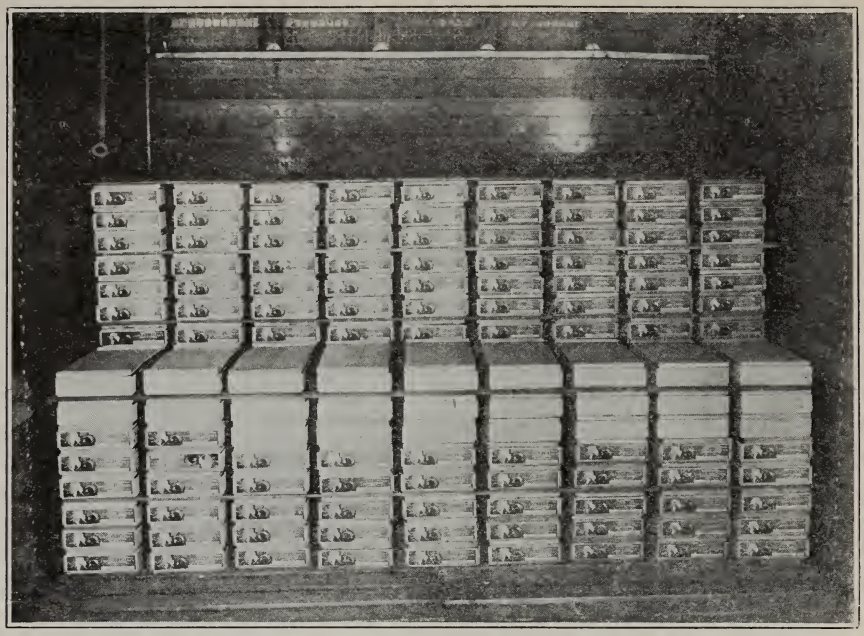

Fig. 12.—Interior of a refrigerating car, showing the method of loading cherry boxes.

Fig. 13.—Panoramic view of a large cherry orchard at picking time. Camp for the fruit workers in the foreground.

THE LABOR PROBLEM

Cherry picking comes as the first spring occupation for those who follow the deciduous fruit harvests throughout the state. Labor at this time is generally plentiful. The pickers are anxious for work and do not demand exorbitant wages. Keeping the help satisfied, however, so that they will remain, is a problem which each grower should carefully consider. The largest fruit growers provide camp grounds for their help. (Fig. 13.) Practically all the necessary equipment is furnished by the owner, such as tents or cabins, beds, mattresses, cooking and heating stoves, fuel, drinking water, shower baths, sanitation, and police regulation. Some of the help choose to board themselves, while others prefer to be boarded. In the latter case the owner must provide a cook and a mess house.